

**780 CMR FIGURE 5602.6.1
TOP PLATE FRAMING TO ACCOMMODATE PIPING**

For SI: 1 inch = 25.4 mm.

5602.6.1 Drilling and Notching of Top Plate.

When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting or notching of the top plate by more than 50% of its width, a galvanized metal tie of not less than 0.054 inches thick (1.37 mm) (16 ga) and 1½ inches (38 mm) wide shall be fastened to each plate across and to each side of the opening with not less than eight 16d nails at each side or equivalent. See 780 CMR Figure 5602.6.1.

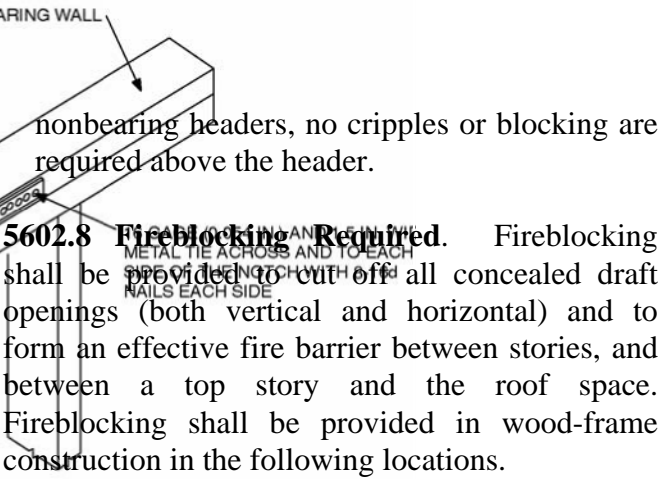
Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.

5602.7 Headers. For header spans *see* 780 CMR Tables 5502.5(1) and 5502.5(2).

5602.7.1 Wood Structural Panel Box Headers. Wood structural panel box headers shall be constructed in accordance with 780 CMR Figure 5602.7.2 and 780 CMR Table 5602.7.2.

5602.7.2 Nonbearing Walls. Load-bearing headers are not required in interior or exterior nonbearing walls. A single flat two-inch-by-four-inch (51 mm by 102 mm) member may be used as a header in interior or exterior nonbearing walls for openings up to eight feet (2438 mm) in width if the vertical distance to the parallel nailing surface above is not more than 24 inches (610 mm). For such

5602.8.1 Materials. Except as provided in 780 CMR 5602.8, Item 4, fireblocking shall consist of two-inch (51 mm) nominal lumber, or two thicknesses of one-inch (25.4 mm) nominal lumber with broken lap joints, or one thickness of ²³/₃₂-inch (19.8 mm) wood structural panels with joints backed by ²³/₃₂-inch (19.8 mm) wood structural panels or one thickness of ³/₄-inch (19.1 mm) particleboard with joints backed by ³/₄-inch (19.1 mm) particleboard, ¹/₂-inch (12.7 mm) gypsum board, or ¹/₄-inch (6.4 mm) cement-based millboard. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fire block. Batts or blankets of mineral or glass fiber or other approved non-rigid materials shall be permitted for compliance with the ten foot horizontal fireblocking in walls constructed using parallel



5602.8 Fireblocking Required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and parti-tions, including furred spaces and parallel rows of studs or staggered studs; as follows:
 - 1.1. Vertically at the ceiling and floor levels.
 - 1.2. Horizontally at intervals not exceeding ten feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with 780 CMR 3511.2.2.
4. At openings around vents, pipes, and ducts at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion.
5. For the fireblocking of chimneys and fireplaces, see 780 CMR 6001.16.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

rows of studs or staggered studs. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

5602.8.1.1 Unfaced Fiberglass. Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.

5602.8.1.2 Fireblocking Integrity. The integrity of all fireblocks shall be maintained.

THE MASSACHUSETTS STATE BUILDING CODE

5602.9 Cripple Walls. Foundation cripple walls shall be framed of studs not less in size than the studding above. When exceeding four feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story.

Cripple walls with a stud height less than 14 inches (356 mm) shall be sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with 780 CMR Table 5602.3(1), or the cripple walls shall be constructed of solid blocking. Cripple walls shall be supported on continuous foundations.

5602.10 Wall Bracing. All exterior walls shall be braced in accordance with 780 CMR 5602. In addition, interior braced wall lines shall be provided in accordance with 780 CMR 5602.10.1.1.

5602.10.1 Braced wall lines. Braced wall lines shall consist of braced wall panel construction methods in accordance with 780 CMR 5602.10.3. The amount and location of bracing shall be in accordance with 780 CMR Table 5602.10.1. Braced wall panels shall begin no more than 12.5 feet (3810 mm) from each end of a braced wall line. Braced wall panels that are counted as part of a braced wall line shall be in line, except that offsets out-of-plane of up to four feet (1219 mm) shall be permitted provided that the total out-to-out offset dimension in any braced wall line is not more than eight feet (2438 mm).

A designed collector shall be provided if the bracing begins more than 12 feet (3658 mm) from each end of a braced wall line.

5602.10.1.1 Spacing. Spacing of braced wall lines shall not exceed 35 feet (10,668 mm) on center in both the longitudinal and transverse directions in each story.

Exception: Spacing of braced wall lines not exceeding 50 feet shall be permitted where:

1. The wall bracing provided equals or exceeds the amount of bracing required by 780 CMR Table 5602.10.1 multiplied by a factor equal to the braced wall line spacing divided by 35 feet, and
2. The length-to-width ratio for the floor/wall diaphragm does not exceed 3:1.

5. Gypsum board with minimum ½-inch (12.7 mm) thickness placed on studs spaced a maximum of 24 inches (610 mm) on center and fastened at seven inches (178 mm) on

5602.10.2 Cripple Wall Bracing.

5602.10.2.1 Cripple Wall Bracing for Basic Wind Speeds. Cripple walls shall be braced with an amount and type of bracing as required for the wall above in accordance with 780 CMR Table 5602.10.1.

5602.10.2.2 Seismic Design. *Not applicable for one-and two-family dwellings.*

5602.10.2.3 Redesignation of Cripple Walls.

Cripple walls are permitted to be redesignated as the first story walls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories respectively.

5602.10.3 Braced Wall Panel Construction Methods. The construction of braced wall panels shall be in accordance with one of the following methods:

1. Nominal one-inch-by-four-inch (25.4 mm by 102 mm) continuous diagonal braces let in to the top and bottom plates and the intervening studs or approved metal strap devices installed in accordance with the manufacturer's specifications. The let-in bracing shall be placed at an angle not more than 60 degrees (1.06 rad) or less than 45 degrees (0.79 rad) from the horizontal.
2. Wood boards of ½ inch (15.9 mm) net minimum thickness applied diagonally on studs spaced a maximum of 24 inches (610 mm). Diagonal boards shall be attached to studs in accordance with 780 CMR Table 5602.3(1).
3. Wood structural panel sheathing with a thickness not less than 5/16 inch (7.9 mm) for 16-inch (406 mm) stud spacing and not less than ¾ inch (9.5 mm) for 24-inch (610 mm) stud spacing. Wood structural panels shall be installed in accordance with 780 CMR Table 5602.3(3).
4. ½ (12.7 mm) or 5/8-inch (19.8 mm) thick structural fiberboard sheathing applied vertically or horizontally on studs spaced a maximum of 16 inches (406 mm) on center. Structural fiberboard sheathing shall be installed in accordance with 780 CMR Table 5602.3(1).

center with the size nails specified in 780 CMR Table 5602.3(1) for sheathing and 780 CMR Table 5702.3.5 for interior gypsum board.

WALL CONSTRUCTION

6. Particleboard wall sheathing panels installed in accordance with 780 CMR Table 5602.3(4)

7. Portland cement plaster on studs spaced a maximum of 16 inches (406 mm) on center and installed in accordance with 780 CMR 5703.6.
8. Hardboard panel siding when installed in accordance with 780 Table 5703.4.

Exception: Alternate braced wall panels constructed in accordance with 780 CMR 5602.10.6 shall be permitted to replace any of the above methods of braced wall panels.

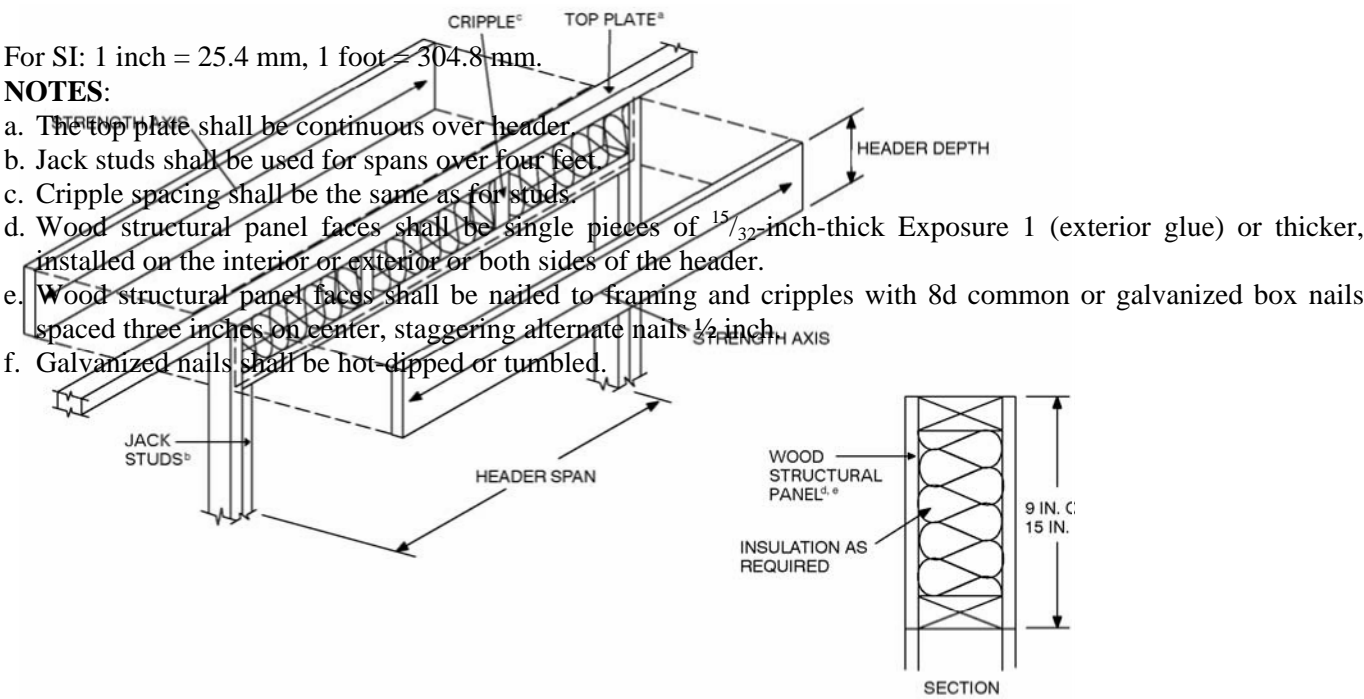
780 CMR TABLE 5602.7.2
MAXIMUM SPANS FOR WOOD STRUCTURAL PANEL BOX HEADERS^a

HEADER CONSTRUCTION ^b	HEADER DEPTH (inches)	HOUSE DEPTH (feet)				
		24	26	28	30	32
Wood structural panel—one side	9	4	4	3	3	—
	15	5	5	4	3	3
Wood structural panel—both sides	9	7	5	5	4	3
	15	8	8	7	7	6

- For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
- a. Spans are based on single story with clear-span trussed roof or two-story with floor and roof supported by interior-bearing walls.

b. See Figure 5602.7 .2 for construction details.

780 CMR FIGURE 5602.7.2
TYPICAL WOOD STRUCTURAL PANEL BOX HEADER CONSTRUCTION



780 CMR: STATE BOARD OF BUILDING REGULATIONS AND STANDARDS

THE MASSACHUSETTS STATE BUILDING CODE

780 CMR TABLE 5602.10.1

WALL BRACING

BASIC WIND SPEED	CONDITION	TYPE OF BRACE ^{a,b}	AMOUNT OF BRACING ^c
100 mph and less	One story Top of two or three story	Methods 1, 2, 3, 4, 5, 6, 7 or 8	Located at each end and at least every 25 feet on center but not less than 16% of braced wall line for Methods 2 through 8.
	First story of two story Second story of three story	Methods 1, 2, 3, 4, 5, 6, 7 or 8	Located at each end and at least every 25 feet on center but not less than 16% of braced wall line for Method 3 and 25% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
	First story of three story	Methods 2, 3,4, 5, 6, 7 or 8	Minimum 48-inch-wide panels located at each end and at least every 25 feet on center but not less than 25% of braced wall line for Method 3 and 35% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
Less than 110 mph	One story Top of two or three story	Methods 1, 2, 3, 4, 5, 6, 7 or 8	Located at each end and at least every 25 feet on center but not less than 16% of braced wall line for Method 3 and 25% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
	First story of two story Second story of three story	Methods 2, 3, 4, 5, 6, 7 or 8	Located at each end and at least every 25 feet on center but not less than 30% of braced wall line for Method 3 and 45% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
	First story of three story	Methods 2, 3, 4, 5, 6, 7 or 8	Located at each end and at least every 25 feet on center but not less than 45% of braced wall line for Method 3 and 60% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
Less than 110 mph	One story Top of two or three story	Methods 2, 3, 4, 5, 6, 7 or 8	Located at each end and at least every 25 feet on center but not less than 20% of braced wall line for Method 3 and 30% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
	First story of two story Second story of three story	Methods 2, 3, 4, 5, 6, 7 or 8	Located at each end and not more than 25 feet on center but not less than 45% of braced wall line for Method 3 and 60% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
	First story of three story	Methods 2, 3, 4, 5, 6, 7 or 8	Located at each end and not more than 25 feet on center but not less than 60% of braced wall line for Method 3 and 85% of braced wall line for Method 2, 4, 5, 6, 7 or 8.
Less than 110 mph	One story Top of two story	Methods 2, 3, 4, 5, 6, 7 or 8	Located at each end and at least every 25 feet on center but not less than 25% of braced wall line for Method 3 and 40% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
	First story of two story	Methods 2, 3, 4, 5, 6, 7 or 8	Located at each end and not more than 25 feet on center but not less than 55% of braced wall line for Method 3 and 75% of braced wall line for Methods 2, 4, 5, 6, 7 or 8.
	Cripple walls	Method 3	Located at each end and not more than 25 feet on center but not less than 75% of braced wall line.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kN/m², 1 mile per hour = 1.609 km/h.

a. Foundation cripple wall panels shall be braced in accordance with 780 CMR 5602.10.2.

b. Methods of bracing shall be as described in 780 CMR 5602.10.3. The alternate braced wall panels described in 780 CMR 5602.10.6 shall also be permitted.

c. When the dead load of the roof/ceiling exceeds 15psf, the bracing amounts shall be increased in accordance with 780 CMR 5301.2.2.4. Bracing required for a site’s wind speed shall not be adjusted.

5602.10.4 Length of Braced Panels. For 780 CMR 5602.10.3 Methods 2., 3., 4., 6., 7. and 8., each braced wall panel shall be at least 48 inches (1219 mm) in length, covering a minimum of three stud spaces where studs are spaced 16 inches (406 mm) on center and covering a minimum of two stud spaces where studs are spaced 24 inches (610 mm) on center. For 780 CMR 5602.10.3 Method 5. each braced wall panel shall be at least 96 inches (2438 mm) in length where applied to one face of a braced wall panel and at least 48 inches (1219 mm) where applied to both faces.

Exceptions:

- 1. Lengths of braced wall panels for continuous wood structural panel sheathing shall be in accordance with 780 CMR 5602.10.5.
- 2. Lengths of alternate braced wall panels shall be in accordance with 780 CMR 5602.10.6.

5602.10.5 Continuous Structural Panel Sheathing. When continuous wood structural panel sheathing is provided in accordance with 780 CMR 5602.10.3 Method 3. on all sheathable areas of all exterior walls, and interior braced wall lines, where required, including areas above and below openings, braced wall panel lengths shall be in accordance with 780 CMR Table 5602.10.5. Wood structural panel sheathing shall be installed at corners in accordance with 780 CMR Figure 5602.10.5. The bracing amounts in 780 CMR Table 5602.10.1 for 780 CMR 5602.10.3 Method 3 shall be permitted to be multiplied by a factor of 0.9 for walls with a maximum opening height that does not exceed 85% of the wall height or a factor of 0.8 for walls with a maximum opening height that does not exceed 67% of the wall height.

5602.10.6 Alternate Braced Wall Panels. Alternate braced wall lines constructed in accordance with one of the following provisions shall be permitted to replace each four feet (1219 mm) of braced wall panel as required by 780 CMR 5602.10.4:

- 1. In one-story buildings, each panel shall have a length of not less than two feet, eight inches (813 mm) and a height of not more than ten feet (3048 mm). Each panel shall be sheathed on one face with $\frac{1}{2}$ -inch minimum-thickness (9.5 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with 780 CMR Table 5602.3(1) and blocked at all wood structural panel sheathing edges. Two anchor bolts installed in accordance with 780 CMR Figure 5403.1(1) shall be provided in each panel. Anchor bolts shall be placed at panel quarter points. Each panel end stud shall have a tie-down device fastened to the foundation, capable of providing an uplift capacity of at least 1,800 pounds (816.5 kg). The tie-down device shall be installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation or on floor framing supported directly on a foundation which is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom. When the continuous foundation is required to have a depth greater than 12 inches (305mm), a minimum 12-inch-by-12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.
- 2. In the first story of two-story buildings, each braced wall panel shall be in accordance with 780 CMR 5602.10.6 Item 1, except that the wood structural panel sheathing shall be provided on both faces, sheathing edge nailing spacing shall not exceed four inches on center, at least three anchor bolts shall be placed at $\frac{1}{5}$ points, and tie-down device uplift capacity shall not be less than 3,000 pounds (1360.8 kg).

780 CMR TABLE 5602.10.5

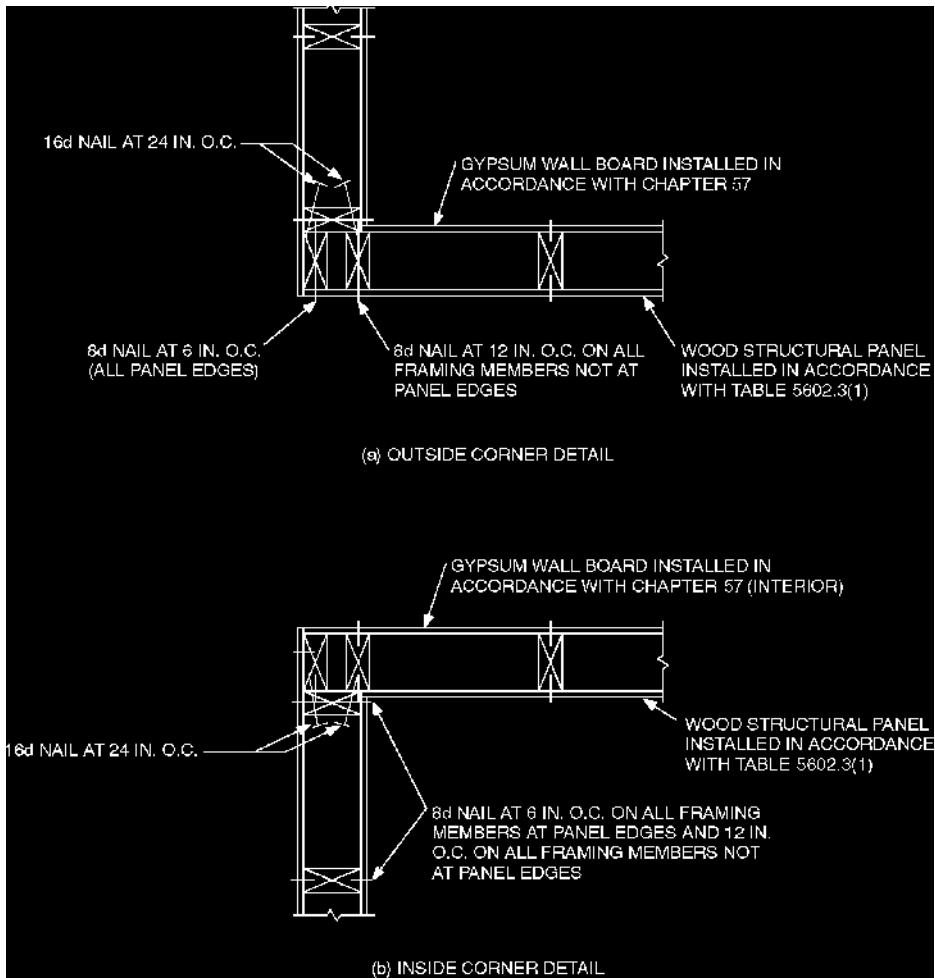
LENGTH REQUIREMENTS FOR BRACED WALL PANELS IN A CONTINUOUSLY SHEATHED WALL^{a,b}

MINIMUM LENGTH OF BRACED WALL PANEL(inches)			MAXIMUM OPENING HEIGHT NEXT TO THE BRACED WALL PANEL(% of wall height)
8-foot wall	9-foot wall	10-foot wall	
48	54	60	100%
32	36	40	85%
24	27	30	65%

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound per square foot = 0.0479kN/m².

- a. Linear interpolation shall be permitted.
- b. Full-height sheathed wall segments to either side of garage openings that support light frame roofs only, with roof covering dead loads of 3 psf or less shall be permitted to have a 4:1 aspect ratio.

780 CMR FIGURE 5602.10.5
EXTERIOR CORNER FRAMING



For SI: 1 inch = 25.4 mm.

5602.10.7 Panel Joints. All vertical joints of panel sheathing shall occur over studs. Horizontal joints in braced wall panels shall occur over blocking of a minimum of 1½ inch (38 mm) thickness.

Exception: Blocking is not required behind horizontal joints when constructed in accordance with 780 CMR 5602.10.3 Method 3, braced-wall-panel construction and 780 CMR Table 5602.10.1, Method 3, or where permitted by the manufacturer’s installation requirements for the specific sheathing material.

5602.10.8 Connections. Braced wall panel sole plates shall be fastened to the floor framing and top plates shall be connected to the framing above in accordance with 780 CMR Table 5602.3(1). Sills shall be fastened to the foundation or slab in accordance with 780 CMR 5403.1.6. Where joists are perpendicular to the braced wall lines above, blocking shall be provided under and in line with the braced wall panels.

5602.10.9 Design of Structural Elements. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in 780 CMR 5602, those portions

shall be designed and constructed in accordance with accepted engineering practice.

780 CMR 5603 STEEL WALL FRAMING

5603.1 General. Elements shall be straight and free of any defects that would significantly affect structural performance. Cold-formed steel wall framing members shall comply with the requirements of 780 CMR 5603.

5603.1.1 Applicability Limits. The provisions of 780 CMR 5603 shall control the construction of exterior steel wall framing and interior load-bearing steel wall framing for buildings not greater than 60 feet (18288 mm) in length perpendicular to the joist or truss span, not greater than 36 feet (10973 mm) in width parallel to the joist span or truss, and not greater than two stories in height with each story not greater than ten feet (3048 mm) high. All exterior walls installed in accordance with the provisions of 780 CMR 5603 shall be considered as load-bearing walls. Steel walls constructed in accordance with the provisions of 780 CMR 5603 shall be limited to sites subjected to a maximum design wind speed of 110 miles per hour Exposure A, B or C and a maximum ground snow load of 70 pounds per foot (3.35 kN/m²).

5603.1.2 In-line Framing. Load-bearing steel studs constructed in accordance with 780 CMR 5603 shall be located directly in-line with joists, trusses and rafters with a maximum tolerance of ¾ inch (19.1 mm) between their center lines. Interior load-bearing steel stud walls shall be supported on foundations or shall be located directly above load-bearing walls with a maximum tolerance of ¾ inch (19.1 mm) between the centerline of the studs.

5603.2 Structural framing. Load-bearing steel wall framing members shall comply with 780 CMR Figure 5603.2(1) and the dimensional and minimum thickness requirements specified in 780 CMR Tables 5603.2(1) and 5603.2(2). Tracks shall comply with 780 CMR Figure 5603.2(2) and shall have a minimum flange width of 1¼ inches (32 mm). The maximum inside bend radius for load-bearing members shall be the greater of 3⁄32 inch (2.4 mm) or twice the uncoated steel thickness. Holes in wall studs and other structural members shall not exceed 1.5 inches (38 mm) in width or four inches (102 mm) in length as shown in 780 CMR Figure 5603.2(3). Holes shall be permitted only along the centerline of the web of the framing member. Holes shall not be less than 24 inches (610 mm) center to center and shall not be located less than ten inches (254 mm) from edge of hole to end of member unless patched in accordance with 780 CMR 5603.3.5.

5603.2.1 Material. Load-bearing steel framing members shall be cold-formed to shape from structural quality sheet steel complying with the requirements of one of the following:

1. ASTM A 653: Grades 33, 37, 40 and 50 (Classes 1 and 3).
2. ASTM A 792: Grades 33, 37, 40 and 50A.
3. ASTM A 875: Grades 33, 37, 40 and 50 (Classes 1 and 3).
4. Steels that comply with ASTM A 653, except for tensile and elongation, shall be permitted, provided the ratio of tensile strength to yield point is at least 1.08 and the total elongation is at least 10% for a two-inch (51 mm) gage length or 7% for an eight-inch (203 mm) gage length.

5603.2.2 Identification. Load-bearing steel framing members shall have a legible label, stencil, stamp or embossment with the following information as a minimum:

1. Manufacturer’s identification.
2. Minimum uncoated steel thickness in inches (mm).
3. Minimum coating designation.
4. Minimum yield strength, in kips per square inch (ksi) (kPa).

5603.2.3 Corrosion Protection. Load-bearing steel framing shall have a metallic coating complying with one of the following:

1. A minimum of G 60 in accordance with ASTM A 653.
2. A minimum of AZ 50 in accordance with ASTM A 792.
3. A minimum of GF 60 in accordance with ASTM A 875.

780 CMR TABLE 5603.2(1)
LOAD-BEARING COLD-FORMED STEEL STUD SIZES

MEMBER DESIGNATION ^a	WEB DEPTH(inches)	MINIMUM FLANGE WIDTH (inches)	MAXIMUM FLANGE WIDTH (inches)	MINIMUM LIP SIZE (inches)
350S162-t	3.5	1.625	2	0.5
550S162-t	5.5	1.625	2	0.5

For SI: 1 inch = 25.4 mm.
a. The member designation is defined by the first number representing the member depth in 1⁄100 inches, the letter “S” representing a stud or joist member, the second number representing the flange width in 1⁄100 inches, and the letter “t” shall be a number representing the minimum base metal thickness in mils [See 780CMR Table 5603.2(2)].

780 CMR TABLE 5603.2(2)
MINIMUM THICKNESS OF COLD-FORMED STEEL STUDS

DESIGNATION (mils)	MINIMUM UNCOATED THICKNESS (inches)	REFERENCE GAGE NUMBER
33	0.033	20
43	0.043	18
54	0.054	16
68	0.068	14

For SI: 1 inch = 25.4 mm, 1 mil = 0.0254 mm.

THE MASSACHUSETTS STATE BUILDING CODE

5603.2.4 Fastening Requirements. Screws for steel- to-steel connections shall be installed with a minimum edge distance and center-to-center spacing of ½ inch (12.7 mm), shall be self-drilling tapping and shall conform to SAE J 78. Structural sheathing shall be attached to steel studs with minimum No. 8 self-drilling tapping screws that conform to SAE J78. Screws for attaching structural sheathing to steel wall framing shall have a minimum head diameter of 0.292 inch (7.4 mm) with countersunk heads and shall be installed with a minimum edge distance of ¾ inch (9.5 mm). Gypsum board shall be attached to steel wall framing with minimum No.6 screws conforming to ASTM C 954 and shall be installed in accordance with 780 CMR 5702. For all connections, screws shall extend through the steel a minimum of three exposed threads. All self-drilling tapping screws conforming to SAE J 78 shall have a Type II coating in accordance with ASTM B 633.

Where No. 8 screws are specified in a steel to steel connection the required number of screws in the connection is permitted to be reduced in accordance with the reduction factors in 780 CMR Table 5505.2.4, when larger screws are used or when one of the sheets of steel being connected is thicker than 33 mils (0.84 mm). When applying the reduction factor the resulting number of screws shall be rounded up.

780 CMR TABLE 5603.2.4
SCREW SUBSTITUTION FACTOR

SCREW SIZE	THINNEST CONNECTED STEEL SHEET (mils)	
	33	43
#8	1	0.67
#10	0.93	0.62
#12	0.86	0.56

For SI: 1 mil = 0.0254 mm.

5603.3 Wall Construction. All exterior steel framed walls and interior load-bearing steel framed walls shall be constructed in accordance with the provisions of 780CMR 5603 and 780 CMR Figure 5603.3.

5603.3.1 Wall to Foundation or Floor Connections. Steel framed walls shall be anchored to foundations or floors in accordance with 780 CMR Table 5603.3.1 and 780 CMR Figure 5603.3.1(1) or 5603.3.1(2).

5603.3.2 Load-bearing Walls. Steel studs shall comply with 780 CMR Tables 5603.3.2(2) through 5603.3.2(7) for steels with minimum yield strength of 33 ksi (227.7 MPa) and 780 CMR Tables 5603.3.2(8) through 5603.3.2(13) for steels with minimum yield strength of 50 ksi (345 MPa). Fastening

requirements shall be in accordance with 780 CMR 5603.2.4 and 780 CMR Table 5603.3.2(1). Tracks shall have the same minimum steel thickness as the wall studs. Exterior walls with a minimum of ½-inch (12.7 mm) gypsum board installed in accordance with 780 CMR 5702 on the interior surface and wood structural panels of minimum 7/16-inch-thick (11.1 mm) oriented strand board or 15/32-inch-thick (11.9 mm) plywood installed in accordance with 780 CMR Table 5603.3.2(1) on the outside surface shall be permitted to use the next thinner stud, from 780 CMR Tables 5603.3.2(2) through 5603.3.2(13) but not less than 33 mils (0.84 mm). Interior load-bearing walls with a minimum of ½-inch (12.7 mm) gypsum board installed in accordance with 780 CMR 5702 on both sides of the wall shall be permitted to use the next thinner stud, from 780 CMR Tables 5603.3.2(2) through 5603.3.2(13) but not less than 33 mils (0.84 mm).

5603.3.3 Stud Bracing. The flanges of steel studs shall be laterally braced in accordance with one of the following:

1. Gypsum board installed with minimum No. 6 screws in accordance with 780 CMR 5702 or structural sheathing installed in accordance with 780 CMR Table 5603.3.2.
2. Horizontal steel strapping installed in accordance with 780 CMR Figure 5603.3 at mid-height for eight-foot (2438 mm) walls, and ¾ points for nine-foot and ten-foot (2743 mm and 3048 mm) walls. Steel straps shall be at least 1.5 inches in width and 33 mils in thickness (38 mm by 0.836 mm). Straps shall be attached to the flanges of studs with at least one No. 8 screw. In-line blocking shall be installed between studs at the termination of all straps. Straps shall be fastened to the blocking with at least two No. 8 screws.

5603.3.4 Cutting and Notching. Flanges and lips of steel studs and headers shall not be cut or notched.

5603.3.5 Hole Patching. Stud web holes with dimensions conforming to 780 CMR 5603.2 that are closer than ten inches (254 mm) from the edge of the hole to the end of the member shall be patched with a solid steel plate, C-section or track section in accordance with 780CMR Figure 5603.3.5. The patch shall be of a minimum thickness as the stud member and shall extend at least one inch (25.4 mm) beyond all edges of the hole. The patch shall be fastened to the web with No. 8 screws (minimum) spaced not greater than one inch

(25.4 mm) center to center along the edges of the patch, with a minimum edge distance of ½ inch (12.7 mm).

5603.3.6 Splicing. Steel studs and other structural members shall not be spliced. Tracks shall be spliced in accordance with 780 CMR Figure 5603.3.6.

5603.4 Corner Framing. Corner studs and the top tracks shall be installed in accordance with 780 CMR Figure 5603.4.

5603.6.1 Jack and King Studs. The number of jack and king studs shall comply with 780 CMR Table 5603.6(4). Jack and King studs shall be of the same dimension and thickness as the adjacent wall studs. Headers constructed of C-shape framing members shall be connected to king studs in accordance with 780 CMR Table 5603.6(5). ½ of the total number of screws shall be applied to the header and ½ to the king stud by use of a minimum two-inch by two-inch (51 mm by 51 mm) clip angle or four-inch (102mm) wide steel plate. The clip angle or plate shall extend the depth of the header minus ½ inch (12.7 mm) and shall have a minimum thickness of the header members or the wall studs, whichever is thicker.

5603.7 Structural Sheathing. In areas where the basic wind speed is less than 110 miles per hour (177 km/h), wood structural sheathing panels shall be installed on all exterior walls of buildings in accordance with 780 CMR 5603.7. Wood structural sheathing panels shall consist of minimum $\frac{7}{16}$ -inch (11.1 mm) thick oriented strand board or $\frac{15}{32}$ -inch (11.9 mm) thick plywood and shall be installed on all exterior wall surfaces in accordance with 780 CMR 5603.7.1 and 780 CMR Figure 5603.3. The minimum length of full height sheathing on exterior walls shall be determined in accordance with 780 CMR Table 5603.7, but shall not be less than 20% of the braced wall length in any case. The minimum percentage of full height sheathing in 780 CMR Table 5603.7 shall include only those sheathed wall sections, uninterrupted by openings, which are a minimum of 48 inches (1120 mm) wide. The minimum percentage of full-height structural sheathing shall be multiplied by 1.10 for nine-foot-high (2743 mm) walls and multiplied by 1.20 for ten-foot-high (3048 mm) walls. In addition, structural sheathing shall:

1. Be installed with the long dimension parallel to the stud framing and shall cover the full vertical height of studs, from the bottom of

5603.5 Exterior Wall Covering. The method of attachment of exterior wall covering materials to cold-formed steel stud wall framing shall conform to the manufacturer's installation instructions.

5603.6 Headers. Headers shall be installed above wall openings in all exterior walls and interior load-bearing walls in accordance with 780 CMR Figure 5603.6 and 780 CMR Table 5603.6(1), Table 5603.6(2), and Table 5603.6(3), or shall be designed and installed in accordance with the AISI Standard for Cold-formed Steel Framing-Header Design (COFS/Header Design).

the bottom track to the top of the top track of each story.

2. Be applied to each end (corners) of each of the exterior walls with a minimum 48-inch-wide (1220 mm) panel.

5603.7.1 Structural Sheathing Fastening. All edges and interior areas of wood, structural sheathing panels shall be fastened to a framing member and tracks in accordance with 780 CMR Table 5603.3.2(1).

5603.7.2 Hold-down Requirements. The percent of structural sheathing, required in 780 CMR Table 5603.7, is permitted to be multiplied by 0.6 where a hold down anchor with a capacity of 4,300 pounds (1952.2 kg) is provided at each end of exterior walls. A single hold-down anchor is permitted to be installed at wall corners.

780 CMR 5604 WOOD STRUCTURAL PANELS

5604.1 Identification and Grade. Wood structural panels shall conform to DOC PS 1 or DOC PS 2. All panels shall be identified by a grade mark or certificate of inspection issued by an approved agency.

5604.2 Allowable Spans. The maximum allowable spans for wood structural panel wall sheathing shall not exceed the values set forth in 780 CMR Table 5602.3(3).

5604.3 Installation. Wood structural panel wall sheathing shall be attached to framing in accordance with 780 CMR Table 5602.3(1). Wood structural panels marked Exposure 1 or Exterior are considered water-repellent sheathing under the code.

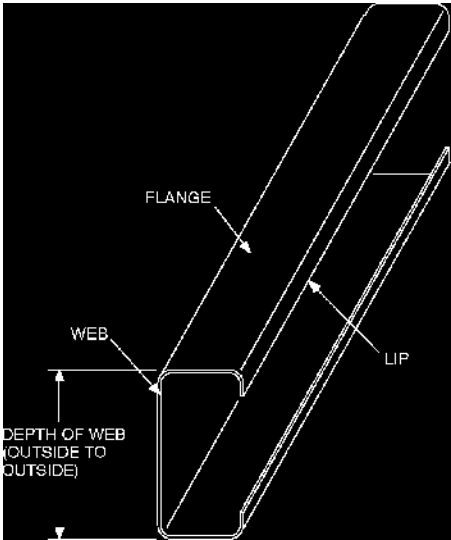
780 CMR 5605 PARTICLEBOARD

5605.1 Identification and Grade. Particleboard shall conform to ANSI A208.1 and shall be so identified by a grade mark or certificate of

THE MASSACHUSETTS STATE BUILDING CODE

inspection issued by an approved agency. specified in 780 CMR Table 5602.3(4).
Particleboard shall comply with the grades

780 CMR FIGURE 5603.2(1)
C-SECTION



780CMR FIGURE 5603.2(2)
TRACK SECTION

